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EXAMINER

LE, DEBBIE M

ART UNIT PAPER NUMBER

2168

DATE MAILED: 12/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/033,584

Applicant(s)

YAMAGAMI, KENJI

Examiner

DEBBIE M. LE

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 October 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 and 16-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 16-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

Applicants' arguments filed on 10/3/05. Claims 1-13 and 16-19 are pending for examinations.

Amending to the title of the invention by Applicants has been acknowledged and accepted.

The rejection under 35 U.S.C 101 to claims 9, 12, 16 and 18, non-statutory subject matter, has been removed with respect to Applicants amended claims 9, 12, 16 and 18.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000.

Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1-13, 16-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Ofek (US Patent 6,654,752 B2).

As per claim 1, Ofek discloses **a method of backup** as replicating copy of data set (col. 20, line 9) **and restore procedure** as restore command (col. 23, line 51) **using a first storage subsystem** as a first data storage (Fig. 1, # 42, col. 8, lines 44-45) **and second storage subsystem** as a second data storage (Fig. 1, #16, col. 8, lines 45-46) **which are connected to each other via a path** as a communication link (Fig.1, # 12), **the first storage subsystem connected to a first host** as the data storage device 42 connects to a remote host system 40 via a channel director 44 (Fig. 1, # 40, # 44, col. 8, lines 47-48), **the second storage subsystem connected to a second host** as data storage device 16 connects to a local host system 13 via a channel director 17 (Fig. 1, # 13, # 17, col. 8, lines 13-17), the method comprising the steps of:

performing a backup procedure comprising the steps of as mirroring operations (col. 10, line 63):

providing a first logical volume in the first storage subsystem as a data storage device 336 resides on the remote system 11 (Fig. 20, #336, #11) **and**

a second logical volume and a third logical volume in the second storage subsystem as a data storage device 333 (as a second logical volume) and a data storage 332 (as a third logical volume) resides on a local system 10 (Fig. 20, # 10, #333 and #332),

the second logical volume being a copied logical volume of the first logical volume a second data storage facility be separates from a first storage facility, mirrors the data in the first data storage facility (abstract, lines 5-7),

the first and second logical volumes being in sync state as the second data storage (Fig. 20, local system 10) is operating normally and is synchronized to the first data storage (Fig. 20, remote system 11), as mirrors the data in the first data storage (abstract, lines 5-7, col. 9, lines 51-53),

the third logical volume being a copied logical volume of the second logical volume as the BCV device 226 as a mirror to the devices 224 and 225 (col. 22, line 52),

the second and third logical volumes being in sync state as the BCV device assigns to each host device that will operate as a mirror synchronized to the data storage devices 224 and 225 (Figs. 8-9, col. 16, lines 32-33, col. 17, lines 14-18, col. 18, lines 9-14, 55-59); and

splitting the second logical volume and the third logical volume by a command from the first storage subsystem as a command to split HOST 220 and the storage unit 223 which comprising two disk volumes 224 and 225 and the third storage volume 226 (see Fig. 13, col. 16, lines 64-67, col. 17, lines 12-13); and

performing a restore procedure comprising the steps of as restore commands (col. 22, line 50):

mounting the third logical volume to the second host as the M1 and M3 or BCV 332 are located on the same LOCAL SYSTEM 10, and the LOCAL SYSTEM 10 communicates to the HOST SYSTEM 13 via a path, that is the channel director, either

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the M1 and M3 or BCV 332 needs to communicate with the HOST SYSTEM 13, they must pass through by the LOCAL SYSTEM 10 using the channel director (Fig. 20);

reading, at the second host, a file to be restored from the third volume as while the BCV device 226 has a valid copy, but the mirror devices 224 and 225 does not contain a valid copy of BCV device 226 (col. 22, lines 54-59),

writing, at the second host, the file to the second volume as the RESTORE command restores the data from the BCV device 226 to the mirror devices 224 and 225 (col. 22, lines 50-60),

re-synchronizing the first volume with the second volume a second data storage facility be separates from a first storage facility, mirrors the data in the first data storage facility (abstract, lines 5-7). Once completion of the operations, the second data storage facility can reconnect with and synchronizes with the first data storage facility thereby to reestablished the mirroring operation (abstract, last 3 lines, Fig. 15).

As per claim 2, Ofek teaches wherein performing a restore procedure further comprises: recovering a database onto the first volume, if a database application is being run on the first host (as an application of updating a database stored in a single host volume A, col. 16, lines 55-63).

As per claim 3, Ofek teaches wherein re-synchronizing the first volume with the second volume further comprises: determining from a pending data bitmap data on the second volume to be copied to the primary volume (as the M3 bits positions in the track

status block for the mirror devices M1 and M2 defined invalid block, this merger identifies only those tracks that need to be updated or refreshed to minimize the number of transfers needed to reestablish synchronism (Figs. 6-7, col. 13, lines 23-30, col. 21, lines 60-67, col. 22, lines 1-9).

As per claim 4, Ofek teaches marking write data arriving after the command in a pending data bitmap, thereby tracking which data has been modified (as altering tracks on the M1 and M2 mirror devices marks the corresponding tracks bit position to a valid state of the M1 and M2 mirror devices 224 and 225, col. 20, lines 7-16, col. 24, lines 17-54).

As per claim 5, Ofek teaches wherein the command comprises identities of one or more files to be restored from the third volume and written to the second volume, and wherein reading, at the second host, a file to be restored from the third volume and writing, at the second host, the file to the second volume, further comprises: reading exclusively the files specified in the command from the third volume and writing the files so read to the second volume (as receiving the reestablish request and all write pendings to the BCV are set to be invalid) (col. 21, lines 57-58). It would be inherent that the BCV device (as "the third volume") is allowed to be "reading exclusively" because only "all write pendings to the BCV are sets to be invalid".

As per claim 6, Ofek discloses a method, comprising:

receiving an indication of files to be restored as mirror devices 224 and 225 does not contain a valid copy of BCV device 226 while a BCV device 226 has a valid copy (Fig. 17, col. 22, lines 54-59);

determining whether the files to be restored comprise contents of an entire volume as restore command restores all data on the BCV device 226 to the mirror devices 224 and 225 (col. 22, lines 51-52), and if so:

splitting remote mirrors existing between production volumes and backup volumes as a command to split HOST 220 and the storage unit 223 which comprising two disk volumes 224 and 225 and the third storage volume 226 (see Fig. 13, col. 16, lines 64-67, col. 17, lines 12-13);

resynchronizing local mirrors existing between the backup volumes and volumes holding data copied from the backup volumes at least one of the volumes holding data copied from the at least one backup volume being located in the same storage subsystem as reconnects the BCV 332 to 224 and 225 devices to synchronize the altered tracks (col. 21, lines 29-30) while the BCV device 226 has a valid copy, but the mirror devices 224 and 225 does not contain a valid copy of BCV device 226 (col. 22, lines 54-59);

resynchronizing remote mirrors for the production volumes and the backup volumes a second data storage facility be separates from a first storage facility, mirrors the data in the first data storage facility (abstract, lines 5-7). Once completion of the operations, the second data storage facility can reconnect with and synchronizes with

the first data storage facility thereby to reestablished the mirroring operation (abstract, last 3 lines, Fig. 15).

As per claim 7, Ofek teaches wherein resynchronizing local mirrors existing between the backup volumes and volumes holding data copied from the backup volumes comprises:

comparing a pending bitmap for the backup volume with a pending bitmap for the volume holding data copied from the backup volume to determine a set of differential data (as verify command that verifies any particular the local and the BCV devices, col. 25, lines 40-42, 60-64, col. 24, lines 43-53); and

copying the differential data from the volume holding data copied from the backup volume to the backup volume (as the M3 bits positions in the track status block for the mirror devices M1 and M2 defined invalid block, this merger identifies only those tracks that need to be updated or refreshed to minimize the number of transfers needed to reestablish synchronism) (Fig. 17, col. 21, lines 60-67, col. 22, lines 1-9).

As per claim 8, Ofek teaches wherein resynchronizing remote mirrors for the production volumes and the backup volumes comprises:

comparing a pending bitmap for the production volume with a pending bitmap for the backup volume to determine a set of differential data (as verify command that verifies any particular the local and remote mirrors is in synchronization with each other (col. 25, lines 40-42, col. 26, lines 1-45); and

copying the differential data from the backup volume to the production volume (as the M3 bits positions in the track status block for the mirror devices M1 and M2 defined invalid block, this merger identifies only those tracks that need to be updated or refreshed to minimize the number of transfers needed to reestablish synchronism) (Fig. 17, col. 21, lines 60-67, col. 22, lines 1-9).

As per claim 9, Ofek discloses a processor-based apparatus, comprising:

means for receiving an indication of files to be restored as mirror devices 224 and 225 does not contain a valid copy of BCV device 226 while a BCV device 226 has a valid copy (col. 22, lines 54-59);

means for determining whether the files to restore comprise contents of an entire volume as restore command restores all data on the BCV device 226 to the mirror devices 224 and 225 (col. 22, lines 51-52);

means for splitting remote mirrors existing between production volumes and backup volumes as a command to split HOST 220 and the storage unit 223 which comprising two disk volumes 224 and 225 and the third storage volume 226 (see Fig. 13, col. 16, lines 64-67, col. 17, lines 12-13);

means for resynchronizing local mirrors existing between the backup volumes and volumes holding data copied from the backup volumes, at least one of the backup volumes and at least one of the volumes holding data copied from the at least one backup volume being located in the same storage subsystem as reconnects the BCV 332 to 224 and 225 devices to synchronize the altered tracks (col.

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21, lines 29-30) while the BCV device 226 has a valid copy, but the mirror devices 224 and 225 does not contain a valid copy of BCV device 226 (col. 22, lines 54-59);

and

means for resynchronizing remote mirrors for the production volumes and the backup volumes a second data storage facility be separates from a first storage facility, mirrors the data in the first data storage facility (abstract, lines 5-7). Once completion of the operations, the second data storage facility can reconnect with and synchronizes with the first data storage facility thereby to reestablished the mirroring operation (abstract, last 3 lines, Fig. 15).

As per claim 10, Ofek discloses method of restoring a file to a first storage **subsystem connected to a first host** as the data storage device 42 connects to a remote host system 40 via a channel director 44 (Fig. 1, # 40, # 44, col. 8, lines 47-48) **from a second storage subsystem connected to a second host** as data storage device 16 connects to a local host system 13 via a channel director 17 (Fig. 1, # 13, # 17, col. 8, lines 13-17), **in accordance with a request from the first host, wherein:**

the first storage subsystem and second storage subsystem are connected to each other via a path as a communication link remote host 11 and local system 10 (Fig. 1, # 12), **the first storage subsystem stores a first logical volume** as a first data storage (Fig. 1, # 42, col. 8, lines 44-45), **the second storage subsystem stores a second logical volume** as a second data storage (Fig. 1, # 16, col. 8, lines 45-46) **and a third logical volume** as a BCV device 332 (Fig. 20), **the second logical**

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volume being a copied logical volume of the first logical volume a second data storage facility be separates from a first storage facility, mirrors the data in the first data storage facility (abstract, lines 5-7), **the third logical volume being a copied logical volume of the second logical volume** as the BCV device 226 as a mirror to the devices 224 and 225 (col. 22, line 52), **the first logical volume and the second logical volume being in a non-sync state** as a command to split HOST 220 and the storage unit 223 which comprising two disk volumes 224 and 225 and the third storage volume 226 (see Fig. 13, col. 16, lines 64-67, col. 17, lines 12-13), **the second and third logical volumes being in sync state** as BCV 332 being reconnected to 224 and 225 devices to synchronize the altered tracks (col. 21, lines 29-30),

the method comprising:

mounting the third logical volume to the second host as the M1 and M3 or BCV 332 are located on the same LOCAL SYSTEM 10, and the LOCAL SYSTEM 10 communicates to the HOST SYSTEM 13 via a path, that is the channel director, either the M1 and M3 or BCV 332 needs to communicate with the HOST SYSTEM 13, they must pass through by the LOCAL SYSTEM 10 using the channel director (Fig. 20),

reading, at the second host, a file to be restored from the third volume as while the BCV device 226 has a valid copy, but the mirror devices 224 and 225 does not contain a valid copy of BCV device 226 (col. 22, lines 54-59) **and**

writing, at the second host, the file to the second volume as the RESTORE command restores the data from the BCV device 226 to the mirror devices 224 and 225 (col. 22, lines 50-60), **and**

re-synchronizing the first volume with the second volume a second data storage facility be separates from a first storage facility, mirrors the data in the first data storage facility (abstract, lines 5-7). Once completion of the operations, the second data storage facility can reconnect with and synchronizes with the first data storage facility thereby to reestablished the mirroring operation (abstract, last 3 lines, Fig. 15).

As per claim 11, Ofek teaches mounting the third logical volume to the second host comprises: **responsive to a command from the first storage subsystem, splitting the sync state between the second logical volume and the third logical volume** as a command to split HOST 220 and the storage unit 223 which comprising two disk volumes 224 and 225 and the third storage volume 226 (see Fig. 13, col. 16, lines 64-67, col. 17, lines 12-13).

As per claim 12, Ofek discloses a processor-based storage subsystem, comprising:

a first logical volume as M1 and M3 mirror devices 224 and 225 (Fig. 20),
a second logical volume as BCV 332 (Fig. 20), **the first logical volume and the second logical volume being located in the same storage subsystem** as the M1 and M3 and BCV 332 are located on the same LOCAL SYSTEM 10 (Fig. 20), and
an interface to a path as a communication link (Fig.1, # 12), **providing connectivity to a primary storage subsystem** as remote system 11 (Fig. 20),
the second logical volume being a copied logical volume of the first logical

volume a second data storage facility be separates from a first storage facility, mirrors the data in the first data storage facility (abstract, lines 5-7),

the first logical volume operative to be selectively placed into one of a sync state and a non-sync state with a logical volume in the primary storage subsystem as a command to split HOST 220 and the storage unit 223 which comprising two disk volumes 224 and 225 and the third storage volume 226 (see Fig. 13, col. 16, lines 64-67, col. 17, lines 12-13),

the first logical volume and second logical volume being in sync state as BCV 332 being reconnected to 224 and 225 devices to synchronize the altered tracks (col. 21, lines 29-30),

the second logical volume operative to permit host access to read files to be restored from the second logical volume as while the BCV device 226 has a valid copy, but the mirror devices 224 and 225 does not contain a valid copy of BCV device 226 (col. 22, lines 54-59), the LOCAL SYSTEM 10 communicates to the HOST SYSTEM 13 via a path, that is the channel director (Fig. 20) **and write the files to be restored to the first logical volume responsive to a restore command** as the RESTORE command could then restore the data from the BCV device 226 to the mirror devices 224 and 225 (col. 22, lines 50-60), **and**

the second storage subsystem operative to establish a sync state between the first logical volume and the second logical volume as BCV 332 being reconnected to 224 and 225 devices to synchronize the altered tracks (col. 21, lines 29-30).

As per claim 13, Ofek discloses a computer program product, comprising:

code for receiving an indication of files to be restored as mirror devices 224 and 225 does not contain a valid copy of BCV device 226 while a BCV device 226 has a valid copy (col. 22, lines 54-59);

code for determining whether the files to be restored comprise contents of an entire volume as restore command restores all data on the BCV device 226 to the mirror devices 224 and 225 (col. 22, lines 51-52), **and if so invoking a plurality of codes, comprising:**

code for splitting remote mirrors existing between production volumes and backup volumes as a command to split HOST 220 and the storage unit 223 which comprising two disk volumes 224 and 225 and the third storage volume 226 (see Fig. 13, col. 16, lines 64-67, col. 17, lines 12-13);

code for resynchronizing local mirrors existing between the backup volumes and volumes holding data copied from the backup volumes, at least one of the backup volumes and at least one of the volumes holding data copied from the at least one backup volume being located in the same storage subsystem as reconnects the BCV 332 to 224 and 225 devices to synchronize the altered tracks (col. 21, lines 29-30) while the BCV device 226 has a valid copy, but the mirror devices 224 and 225 does not contain a valid copy of BCV device 226 (col. 22, lines 54-59);

code for resynchronizing remote mirrors for the production volumes and the backup volumes a second data storage facility be separates from a first storage

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facility, mirrors the data in the first data storage facility (abstract, lines 5-7). Once completion of the operations, the second data storage facility can reconnect with and synchronizes with the first data storage facility thereby to reestablished the mirroring operation (abstract, last 3 lines, Fig. 15); and

a computer readable storage medium that holds the codes as performing backup operations with the execution of applications programs in a computer system (col. 3, lines 20-24, col. 7, lines 57-64).

As per claim 16, Ofek discloses a processor-based apparatus, comprising:

Means for receiving a command as the BCV device 226 receives a split command or request (Fig. 13, col. 19, lines 9-10);

Means for splitting a sync state existing between a second storage means and a third storage means as the BVC device 226 receives the split command (col. 19, lines 9-10) and its mirror operation is discontinued by setting the device to a not ready state (col. 19, lines 20-21), **the second storage means and the third storage means being located in the same storage subsystem** as the M1 and M3 and BCV 332 are located on the same LOCAL SYSTEM 10 (Fig. 20);

means for making information on the third storage means available for reading as BCV 332 being reconnected to 224 and 225 devices to synchronize the altered tracks (col. 21, lines 29-30);

means for reading a file to be restored from the third storage means as while the BCV device 226 has a valid copy, but the mirror devices 224 and 225 does not contain a valid copy of BCV device 226 (col. 22, lines 54-59);

means for writing the file to the second storage means as the RESTORE command restores the data from the BCV device 226 to the mirror devices 224 and 225 (col. 22, lines 50-60); **and**

means for re-synchronizing the second storage means with a first storage means a second data storage facility be separates from a first storage facility, mirrors the data in the first data storage facility (abstract, lines 5-7). Once completion of the operations, the second data storage facility can reconnect with and synchronizes with the first data storage facility thereby to reestablished the mirroring operation (abstract, last 3 lines, Fig. 15).

As per claim 17, Ofek teaches wherein means for making information on the third storage means available for reading further comprises means for **mounting the third storage means to a means for processing information stored by the third storage means** as the M1 and M3 or BCV 332 are located on the same LOCAL SYSTEM 10, and the LOCAL SYSTEM 10 communicates to the HOST SYSTEM 13 via a path, that is the channel director, BCV 332 needs to communicate with the HOST SYSTEM 13, it must pass through by the LOCAL SYSTEM 10 using the channel director (Fig. 20).

As per claim 18, Ofek discloses a computer program product, comprising:

code for receiving a command as the BCV device 226 receives a split command or request (Fig. 13, col. 19, lines 9-10);

code for splitting a sync state existing between a second storage unit and a third storage unit as the BVC device 226 receives the split command (col. 19, lines 9-10) and its mirror operation is discontinued by setting the device to a not ready state (col. 19, lines 20-21), **the second storage unit and the third storage unit being located in the same storage subsystem** as the M1 and M3 and BCV 332 are located on the same LOCAL SYSTEM 10 (Fig. 20);

code for making information on the third storage unit available for reading as BCV 332 being reconnected to 224 and 225 devices to synchronize the altered tracks (col. 21, lines 29-30);

code for reading a file to be restored from the third storage unit as while the BCV device 226 has a valid copy, but the mirror devices 224 and 225 does not contain a valid copy of BCV device 226 (col. 22, lines 54-59);

code for writing the file to the second storage unit as the RESTORE command restores the data from the BCV device 226 to the mirror devices 224 and 225 (col. 22, lines 50-60);

code for re-synchronizing the second storage unit with a first storage unit a second data storage facility be separates from a first storage facility, mirrors the data in the first data storage facility (abstract, lines 5-7). Once completion of the operations, the second data storage facility can reconnect with and synchronizes with the first data

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storage facility thereby to reestablished the mirroring operation (abstract, last 3 lines, Fig. 15); and

a computer-readable storage medium that holds the codes as performing backup operations with the execution of applications programs in a computer system (col. 3, lines 20-24, col. 7, lines 57-64).

As per claim 19, Ofek discloses a system, comprising:

a first storage subsystem connected to a first host as the data storage device 42 connects to a remote host system 40 via a channel director 44 (Fig. 1, # 40, # 44, col. 8, lines 47-48),

a second storage subsystem connected to a second host as data storage device 16 connects to a local host system 13 via a channel director 17 (Fig. 1, # 13, # 17, col. 8, lines 13-17), wherein:

the first storage subsystem and the second storage subsystem are connected to each other via a path as a communication link remote host 11 and local system 10(Fig.1, # 12),

the first storage subsystem stores a first logical volume as a data storage device 336 resides on the remote system 11 (Fig. 20, #336, #11),

the second storage subsystem stores a second logical volume and a third logical volume as a data storage device 333 (as a second logical volume) and a data storage 332 (as a third logical volume) resides on a local system 10 (Fig. 20, # 10, #333 and #332),

the second logical volume being a copied logical volume of the first logical volume a second data storage facility be separates from a first storage facility, mirrors the data in the first data storage facility (abstract, lines 5-7),

the third logical volume being a copied logical volume of the second logical volume as the BCV device 226 as a mirror to the devices 224 and 225 (col. 22, line 52),

the first logical volume and the second logical volume being in a non-sync state as a command to split HOST 220 and the storage unit 223 which comprising two disk volumes 224 and 225 and the third storage volume 226 (see Fig. 13, col. 16, lines 64-67, col. 17, lines 12-13),

the second and third logical volumes being in sync state as BCV 332 being reconnected to 224 and 225 devices to synchronize the altered tracks (col. 21, lines 29-30),

the second storage subsystem operative to mount the third logical volume to the second host responsive to a restore command as the M1 and M3 or BCV 332 are located on the same LOCAL SYSTEM 10, and the LOCAL SYSTEM 10 communicates to the HOST SYSTEM 13 via a path, that is the channel director, either the M1 and M3 or BCV 332 needs to communicate with the HOST SYSTEM 13, they must pass through by the LOCAL SYSTEM 10 using the channel director (Fig. 20),

the host operative to read files to be restored from the third volume as while the BCV device 226 has a valid copy, but the mirror devices 224 and 225 does not contain a valid copy of BCV device 226 (col. 22, lines 54-59) and

write the files to be restored to the second volume as the RESTORE command restores the data from the BCV device 226 to the mirror devices 224 and 225 (col. 22, lines 50-60), and

the second storage subsystem operative to establish a sync state between the first logical volume and the second logical volume a second data storage facility be separates from a first storage facility, mirrors the data in the first data storage facility (abstract, lines 5-7). Once completion of the operations, the second data storage facility can reconnect with and synchronizes with the first data storage facility thereby to reestablished the mirroring operation (abstract, last 3 lines, Fig. 15).

Response to Arguments

Applicant's arguments filed 10/03/05 have been fully considered but they are not persuasive.

First, Applicants argue that Ofek fails to disclose the claimed limitation "mounting the third volume to the second host."

In response, Examiner respectfully disagrees.

Examiner respectfully submits that Ofek discloses, Fig. 20, "second host, second volume, and third volume" as recited in the instant independent claim 1. That is, "the second host" is equivalent to Ofek's *the host system 13*, "the second volume" is equivalent to Ofek's *the mirror devices M1 and M3 or element 333*, and "the third volume" is equivalent to Ofek's *the BCV 332 (backup device)* (Ofek's Fig. 20 respectively). As seen, the BCV 332 and the mirror devices M1 and M3 reside on the

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same storage system "LOCAL SYSTEM 10" and the LOCAL SYSTEM 10 connects the "HOST SYSTEM 13" by a channel director. The channel director provides communication between the HOST SYSTEM 13 and the LOCAL SYSTEM 10 (col. 7, lines 66-67, col. 8, lines 13-16). Because the M1 and M3 or BCV 332 are located on the same LOCAL SYSTEM 10, and the LOCAL SYSTEM 10 communicates to the HOST SYSTEM 13 via a path, that is the channel director. Therefore, either the M1 and M3 or BCV 332 needs to communicate with the HOST SYSTEM 13, they must pass through by the LOCAL SYSTEM 10 using the channel director.

Accordingly, Ofek discloses "mounting the third volume to the second host."

Next, Applicants argue Ofek fails to disclose method of restoring a file, e.g., a corrupted or damaged or lost file, to the second logical volume in a backup subsystem. Applicant stated that the RESTORE command enables full restoration of all data on the BCV device to the mirror devices 224 and 225.

In response, examiner respectfully disagrees.

Examiner respectfully submits that Ofek discloses if a disk failure or file corruption event were to occur so that the data sets in both the M1 and M2 mirror device 224 and 225 were invalid, the RESTORE command could then restore the data from the BCV device 226 to the mirror devices 224 and 225 (col. 22, lines 50-60). Since the rejected claimed recited the limitation "a file to be restored", as broadly interpreted, this limitation can be read as "restore the data from the BCV device", wherein the data contains in the BCV device would be treated as "a file". Because Ofek discloses the

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restore command restores the data from the BCV device to the device 224 and 225, Examiner submits that the disclosure reads on the limitation.

Accordingly, Ofek discloses "restoring a file from the third volume to the second volume."

Last, Applicants argue Ofek fails to disclose "re-synchronizing the second logical volume in the backup subsystem with the first logical volume in the production storage subsystem."

In response, Examiner respectfully disagrees.

Examiner respectfully submits that Ofek discloses the instant claimed element "re-synchronizing the first volume with the second volume." Ofek discloses a second data storage facility be separates from a first storage facility, mirrors the data in the first data storage facility (abstract, lines 5-7). Once completion of the operations, the second data storage facility can reconnect with and synchronizes with the first data storage facility thereby to reestablished the mirroring operation (abstract, last 3 lines, Fig. 15).

According, Ofek discloses "re-synchronizing the first volume with the second volume" as claimed.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DEBBIE M. LE whose telephone number is (571) 272-4111. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JEFFREY GAFFIN can be reached on (571) 272-4146. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



DEBBIE M LE
Examiner
Art Unit 2168

Debbie Le

Nov. 27, 2005.